Illinois Department of Transportation

Memorandum

To:	Diane O'Keefe	Attn: Thomas Sancken
From:	Ralph E. Anderson	By: Todd E. Ahrens
Subject:	BRIDGES AND STRUCTURES	
Date:	April 19, 2004	

FAS Route 1279 — P-93-035-01
Section (1)BR & I — SN 050-0088
LaSalle County

IL Route 178 over the Illinois River at Utica

We have reviewed the Consultant prepared Bridge Condition Report (BCR). The BCR recommends:

- Approach and truss spans deck replacement.
- Approach and truss spans welded cover plate termination retrofit.
- Removal of fabrication tack welds in truss spans.
- Remove four of the seven existing truss span stringer lines and add five new stringer lines.
- Install new navigation and roadway lighting systems.
- Work to be performed using stage construction.

After reviewing the BCR, we have the following comments:

1. Based on the deteriorated condition of the existing structure, we agree that as a minimum deck replacement is appropriate. Complete truss floor system and approach span superstructure removal and replacement appears to be structurally and economically justifiable but would require road closure. Based on the District's desire to keep the bridge open to traffic, we concur with the recommendation of deck replacement. We recommend that all of the existing truss stringers be removed and replaced based on their deteriorated condition and the new proposed roadway cross section. Stage construction during deck replacement appears feasible.

Recorded in ACCESS 5/6/04

2. Based on the current reported truck traffic, a fatigue evaluation is not required in accordance with Bridge Manual paragraph 2.6.13 (2). However, since the Consultant stated that there is no remaining fatigue life remaining at the welded cover plate terminations, we performed an independent evaluation per the AASHTO Guide Specification for Fatigue Evaluation of Existing Steel Bridges. Our calculations show that all cover plate terminations have in excess of 50 years mean fatigue life remaining. The welded cover plate terminations do not require retrofitting. The presence of welded cover plates does not have any effect on the ratings of the structure.

3. We do not feel that removal of all of the existing fabrication tack welds is necessary. The five cracked welds that have been found so far should be ground out and inspected during this work. The remainder of the tack welds should be monitored during normal inspections.

4. The approach span beams should be made composite with the new concrete deck in the positive moment regions. The new truss stringers should also be made composite.

5. Installation of new navigation and/or roadway lighting systems is at the District's discretion in coordination with the US Coast Guard.

6. We suggest that a deck width of 34'-6" out-to-out be considered. See attached sketch for a proposed cross section. To reduce dead loads and maximize bridge clear width, we recommend the use of Steel Bridge Rail Curb Mounted (2399). Preliminary calculations indicate that a future wearing surface will not be allowed.

The BCR also investigated three options for providing a bikeway across the river:

- Cantilever a bike path structure off the east side of the existing truss.

- Separate bike path superstructure on widened or new substructure. The Consultant proposes a superstructure consisting of a reinforced concrete deck on three welded plate girders. The proposed cross section provides a 14-foot clear width between F-shape parapets.

- Complete superstructure replacement and substructure widening using stage construction. The Consultant proposes a superstructure consisting of a reinforced concrete deck on welded plate girders. The proposed cross section provides a 40-foot clear roadway width with a separated 14-foot clear bike path width between F-shape parapets.

After reviewing the bike path options, we have the following comments:

1. We concur with the Consultant's assessment that cantilevering a bike path structure off the side of the existing truss is not readily feasible. Significant strengthening of the truss to carry the additional live and dead loads would be required. The ability of the existing substructure to carry the new loads and loading conditions would require additional analysis.

2. A separate plate girder bike path structure alongside of the existing structure does not appear to be readily feasible. A through truss, cabled stayed, or suspension bridge would normally be the preferred structure type to span the 378-foot main navigation channel. The ability of the existing substructure to carry the new loads and loading conditions would require additional analysis. If this option is pursued, the proposed bike path cross section should be revised to provide a 10-foot clear width (see Design and Environment Manual paragraph 17-2.01(f)), and a bicycle railing similar to that shown on Bridge Manual Base Sheet R-29 should be considered.

3. Complete superstructure replacement with a plate girder structure does not appear readily feasible. A through truss, cabled stayed, or suspension bridge would normally be the preferred structure type to span the 378-foot main navigation channel. The feasibility of reconstructing the existing two column piers to accommodate the proposed new plate girder bearing locations, and the ability of the existing substructure to carry the new loads and loading conditions would require additional analysis. If this option is pursued, the proposed cross section should be revised. A clear roadway width of 36-feet should be provided in accordance with Design and Environment Manual Figure 49-3I for the reported current ADT of 3700 vehicles. The separated bike path width and rail type should be revised as discussed above.

4. It is apparent that an addition of a bikeway path across the river will increase the overall scope-of-work and budget of the existing structure.

Subject to the above comments, the Bridge Condition Report is approved. A Type, Size, and Location (TSL) plan, structure report, proposed cross section and proposed plan and profile will be required for this project.

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Route FAS 1279 Sheet ____ of ____
Section (1)BR & I Computed by GLE Date 12/2/03
County LASALLE Checked by ____ Date ____
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